

A cumulus cloud is easy to get, but how many really good photos have you seen of change cirrus, mammato-cumulus, or scarf cloud? These are a few samples of the big game which it pays to go after, and to be able to exhibit a good specimen picture of such a cloud will be found as satisfactory as the showing of a pair of antlers.

PHOTOGRAPHY OF CLOUDS.

By C. J. P. CAVE.

[Excerpt from "The forms of clouds," Quart. Jour. Roy. Meteorological Soc., 1917, 43: 61-82. (From pp. 80-81.)]

The photography of clouds affords a subject of much interest. There is some difficulty in getting the exposure right until the photographer is somewhat experienced. As a general rule very short exposures are necessary. Clayden says that he has found very slow plates the best for the purpose, with no color screen. My own experience is that panchromatic plates and color screens give the most satisfactory results. I use a moderately deep yellow screen for all clouds except cirrus, but for cirrus I think a red screen is the best. When using color screens the exposure must be lengthened more in proportion than if one were taking ordinary subjects such as landscapes.

Stereoscopic photographs of clouds may be taken by having two cameras at some distance apart and taking two photographs simultaneously; the two cameras must be a quarter of a mile or so apart, except for clouds that are very near the observer. There is another way in which such photographs may be taken which I have not seen described before. If a cloud is moving, two photographs may be taken in succession from the same place, the resulting photographs showing a stereoscopic effect. Unless the clouds are moving very slowly it is advisable to take the two photographs as quickly as possible. Those shown (fig. 27 [not reproduced here]) were taken with an interval of about 20 seconds. The clouds must be taken when they are moving in a direction at right angles to the line from the cloud to the observer. (Of course different parts of the cloud may be moving with different velocities, and in this case the stereoscopic effect will not be true. In figure 27 [not reproduced here] it will be seen that there are about six different distances to be seen at the left-hand top corner of the picture. In the case of cloud sheets which are moving fast I have generally found that the stereoscopic effect is exaggerated and the sheet looks as though it were very low down. The chief difficulty in this way of taking stereographic photographs of clouds is that the form of the clouds changes even in the short interval between the two exposures.

CLOUD PHOTOGRAPHY.

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A method recommended for cloud photography consists in the use of a device made up of a mirror of black glass mounted in a special frame and placed in front of the camera lens, so that the photograph will be taken from the mirror and the brilliant light of the clouds will be thus diminished. However, it is difficult to procure such black glass mirrors in ordinary trade, but it is comparatively easy to make a suitable mirror. This is done by taking a piece of clear glass such as is used for making mirrors and roughening one side after the manner of ground glass. On this latter side is applied a coating of black varnish made of Judaea bitumen. This avoids

the double reflection which would be produced by using ordinary glass and simply putting on a coat of varnish. The time of exposure is, of course, much longer than in the usual way and may be from one-fifth to one twenty-fifth second when well stopped down. It is claimed that this arrangement allows of obtaining details of clouds which can not be had otherwise by the most improved plates and screens.

CUMULUS CLOUD OVER FIRE.

By OTTO NEUMER.

On September 13, about 4.30 p. m. (seventy-fifth meridian time) I was approaching New York City on a train, and, when between Rahway and Elizabeth, N. J., I observed a heavy black cloud in the direction of New York City. The cloud, I discovered later, was a smoke cloud and was hanging over New York Bay. The fire, which caused the great volume of smoke was in the Borough of Queens, just across the East River from Manhattan. The smoke rose almost vertically until it reached a height of about 1,500 meters, then passed off apparently horizontally to the southeast or south under the influence of a moderate or strong wind at that altitude. This wall of dense smoke extended from its origin in Queens as far as one could see toward the south. Directly in line with what seemed to be New York Bay, the smoke cloud was capped by a small puff of white—a small cumulus cloud. The formation seemed to be 400 or 500 meters long and very shallow. I do not think it lasted long, although I was unable to observe it longer than 10 minutes. There were no other clouds visible at the time.

NOTE.—The surface meteorological conditions at the New York Weather Bureau, at 4.30 were as follows: Temperature 21.7° C.; wind NW., 8.9 meters per second; dewpoint (noon) 7.8° C. Substituting these values in the equation for the height of the base of the cloud,¹ we obtain 1,800 meters, which is quite in accord with non-instrumental observations of Mr. Neumer.—C. L. M.

METEOROLOGICAL ASPECTS OF A MUNITION-DUMP EXPLOSION AT KIEV, JUNE 6, 1918.

By Dr. FRIEDRICH NOWOTNY.

[Abstracted from *Meteorologische Zeitschrift*, Mar.-Apr., 1920, pp. 67-73.]

At 10 a. m., June 6, 1918, about 11,000 tons of explosives stored at the munition depot of Zwierniec, a suburb of Kiev, were exploded from a fire which started in a bomb factory. The magnitude of the disaster may be surmised from the fact that at least 200 were killed and over 1,000 injured. The town of Zwierniec was almost completely destroyed through the agency of fire and air pressure. Other towns 6 and 8 kilometers distant were badly shaken and much property was destroyed. The meteorological conditions on the day in question were carefully observed both at the Austro-Hungarian meteorological station in that vicinity and by the author.

At the time of the catastrophe the sky was about seven-tenths covered with cumuli, whose bases were at about 1,300 meters elevation. The explosions sent dense masses of black smoke into the air, probably reaching an elevation of 3,600 meters, although the great mass of smoke reached the height of 3,200 meters. The clouds

¹ See "Heights of cumulus clouds forming over fires." MONTHLY WEATHER REVIEW, March, 1919, 147-149.